



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/129,958 08/06/98 MILLS

A LUTEC0008

EXAMINER

HM22/0911

SPENCER AND FRANK  
SUITE 300 EAST  
1100 NEW YORK AVENUE N W  
WASHINGTON DC 20005-3955

MARSCHEI, A	
ART UNIT	PAPER NUMBER

1631  
DATE MAILED:

09/11/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
**09/129,958**

Applicant(s)  
**Mills, Jr. et al.**

Examiner  
**Ardin Marsch I**

Art Unit  
**1631**



**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –**

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1) ☒ Responsive to communication(s) filed on 5/21/01 and 7/2/01

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

## Disposition of Claims

4) ☒ Claim(s) 9-13, 15, and 17-35 is/are pending in the application.

4a) ~~Of the above, claim(s) 1-8, 14, and 16 have been canceled.~~ ~~is/are withdrawn from consideration.~~

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 9-13, 15, and 17-35 is/are rejected.

7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirements.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on May 22, 2001 is: a) ☒ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some\* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

15) ☐ Notice of References Cited (PTO-892)

18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

19) ☐ Notice of Informal Patent Application (PTO-152)

17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_

20) ☐ Other: \_\_\_\_\_

Applicants' arguments, filed 5/21/01 and 7/2/01, have been fully considered but they are not deemed to be persuasive. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claims 11-13, 15, 17-24, and 27-35 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The NEW MATTER rejection based on claim 11, now lines 15-16, is maintained from the previous office action, mailed 12/19/00, as well as against claims dependent therefrom. Applicants argue that the specification contains support for phosphorylating or de-phosphorylating and that it would have been well known in the art that numerous enzymes are capable of each of these reactions. In response, it is acknowledged that written support is present for phosphorylating or de-phosphorylating but not for generic "enzyme-catalyzed reaction" as noted in the previous office action. The manner of phosphorylating or de-phosphorylating is only exemplified by one enzyme each and as such does not

circumscribe a genus of generic enzymes as indicated by the above phrase. Thus, this is still NEW MATTER due to being broader than the specification disclosure. It is additionally noted that applicants did not point to any other generic enzyme disclosure to support the claim wording and therefore are clearly relying on what is obvious in the art to which the legal decision that this is NEW MATTER based on *In re Winkhaus, Tusche, and Kampf* 188 USPQ 129(CCPA 1975) is still applicable.

Claims 17 and those dependent therefrom have been amended to contain NEW MATTER. This rejection is necessitated by amendment. Part (c) of claim 17 has been amended to indicate that the set of  $X_i$  oligomers is greater than the total number of "saturating oligomers". Consideration of the support pointed to by applicants on pages 48 and 49 reveals that said set of  $X_i$  oligomers is greater than the  $E_i$  and  $\bar{E}_i$  strands rather than greater than the number of saturating strands. It is noted that pages 48 and 49 do not equate saturating strands with the  $E_i$  and  $\bar{E}_i$  strands.

Claims 29-35 are rejected as necessitated by amendment due to containing NEW MATTER. These claims are directed to a generic sequences or analogs such that adding one of the oligomers and a complement to a solution then results in "performing an operation" as given in the last 2 lines of claim 29. This type of generic invention description has not been found as filed.

Rather a vector and matrix algebra invention with specifics for each operation is disclosed as summarized in the abstract, for example. Another aspect of NEW MATTER is that said "performing" lacks any specifics such as hybridization, for example. This broadening of description over the invention as filed is NEW MATTER.

Claim 15 is rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 15, lines 1-2, directs the claim practice to "obtaining the outer product matrix of two vectors" and then only cites the obtaining of a set of oligomers without any step that enables either preparation of dimeric oligomers as given in the penultimate line of claim 15 nor enables what generates the outer product. This rejection is maintained and reiterated from the previous office action, mailed 12/19/00. Applicants argue that the amended claim 15 could be followed by one skilled in the art. This is an allegation without factual support as none was pointed to. It is acknowledged from the previous office action that a method is taught regarding 5'-phosphate removal followed by ligation etc. Thus, it seems that only "one" method of outer product practice is described and enabled thus supporting this rejection as not

claiming any significant steps by which to achieve the outer product result since even the steps for this one method are not present in claim 15, such as 5' phosphate removal followed by ligation. Thus, this rejection is maintained and reiterated from the previous office action, mailed 12/19/00.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 9-11 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by either Adleman(Science 266:1021[1994]), Guarnieri et al.(Science 273:220 [1996]), or Oliver (J. Mol. Evol. 45:161[1997]).

This rejection is maintained and reiterated from the previous office action, mailed 12/19/00. Applicants argue that none of the prior art methods disclose methods for which the result of vector or matrix algebra is quantitatively dependent on the concentration of the input oligomers. In response this argument is non-persuasive because these references clearly solve mathematical problems based on matrix algebra due to concentrations of input oligomers as summarized in the previous office action. This summary is repeated below as still deemed to

support this rejection. Applicants firstly argue that Adleman does not employ oligomers representing both positive and negative values as well as the abstracts of Guarnieri et al. or Oliver. In response applicants' invention is directed to methods wherein components of the vectors therein are utilized to represent data as supplied in determining a mathematical result. It is acknowledged by applicants at various points in arguments as also from the instant specification that the vectors may not always have both positive as well as negative components, especially the negative ones. That is, if the input data only contains positive vector components as are utilized in the references then the set of oligomers which are practiced in the method are all positive and still fall within the instant invention practice. Again the instant claims do not limit the component values of the input data and thus are deemed to include positive only vector component practice as is also present in the references. It is noted that an argument of applicants was non-persuasive in anticipation of removal of NEW MATTER. The NEW MATTER has been removed but this only removes this one argument and not the above summary of bases for this rejection.

Claims 25 and 26 are rejected under 35 U.S.C. § 102(b) as being anticipated by Southern (WO 89/10977).

This rejection is maintained and reiterated from the previous office action, mailed 12/19/00, as is repeated below

since it defines dimeric oligomers as required for the instant claims and not argued by applicants specifically regarding the below given support for this rejection.

It is noted that claims 25 and 26 are composition claims directed to content-addressable memory claimed with product by process limitations. Applicants are reminded that such products which may be made by other, possibly completely, different processes may be subject to rejections over prior art which discloses the claimed product(s). In this case consideration of claims 25 and 26 reveals that they are directed to products which are the result of vector mathematical manipulations set forth in the claims as resultant from the formation of an outer product between certain vectors. It is also noted that the claims are not limited in any way as to what vectors are initially utilized for the formation of said outer products. Thus, the components which are in the memory span a vast expanse of possible outer product results. The only limitation is that at least some minimal pool of single-stranded oligomers comprising a set of dimeric oligomers must be present and that it must be content-addressable. Dimeric will be assumed for the purposes of this rejection to indicate that each dimeric oligomer is capable of hybridizing to its complement. The above reference by Southern describes a variety of oligomer arrays both regarding preparation and usage. One such array is disclosed on page 3, lines 9-12,



made up of all possible sequences of a chosen length as enumerated, for example, on page 8, lines 21-35. These are hybridization arrays and so must contain oligomers which are hybridizable to their complement as well as content addressable in order to read out the result of any hybridization experiment. Such an array would correspond to a complex embodiment of the instant invention. A simpler type of set of oligomers is described in an experiment disclosed as starting on page 17 as Example 2 whereon only 2 single-stranded oligomers are present with each optionally hybridizable distinctively with its exactly complementary target. The presence of such complementary target or targets in a sample but yet single-stranded before hybridization to the array is yet another embodiment within the instant claim. On pages 17-20 a probe array of 19-mers is prepared to test 110 base possible sickle cell sequences. These samples contain single-stranded oligomers as well as at least one non-complementary sequence in the 110-mer beyond where it may hybridize to a 19-mer on the array thus also anticipating instant claim 26. It is acknowledged that the citation of the disclosure of Southern regarding a computational composition as instantly claimed may be unexpected but this should serve to illustrate the vast breadth of instant claims 25 and 26.

This disclosure is objected to because it contains an embedded hyperlink and/or other form or browser-executable code.

Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01. It is noted that the specification at page 60, lines 17-18, contains a hyperlink as discussed above. It is not understood how the replacement of the address for this hyperlink with the exact same address for the hyperlink removes this hyperlink. This objection is maintained and has been reiterated from the previous action, mailed 12/19/00.

No claim is allowed.

Applicants' amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL**. See M.P.E.P. § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703)308-4242 or (703)305-3014.

Serial No. 09/129,958

- 10 -

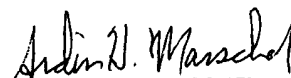
Art Unit: 1631

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ardin Marschel, Ph.D., whose telephone number is (703)308-3894. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, Ph.D., can be reached on (703)308-4028.

Any inquiry of a general nature or relating to the status of this application should be directed to Patent Analyst, Tina Plunkett, whose telephone number is (703)305-3524 or to the Technical Center receptionist whose telephone number is (703)308-0196.

September 7, 2001

  
ARDIN H. MARSCHEL  
PRIMARY EXAMINER